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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,322	10/31/2003	Muneo Mitamura	030673-171	8509

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EXAMINER	
AKANBI, ISIAKA O	

ART UNIT	PAPER NUMBER
2877	

DATE MAILED: 02/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/697,322	MITAMURA ET AL.
	Examiner	Art Unit
	Isiaka O. Akanbi	2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *31 October 2003*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement file 31 October 2003 has been entered and reference considered by the examiner.

Drawings

The examiner approves the drawings filed 31 October 2003.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3, 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmitt (4,85,836).

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over of Schmitt. The reference of Schmitt discloses a projection-type optical encoder comprising of a light emitting element (5), a moving grating plate (1) with moving transmissive grating (2) sections of a predetermined width that are aligned at a fixed pitch, a fixed grating plate (7) with fixed transmissive grating (8) sections of a predetermined width that are aligned at a fixed pitch, a set of light receiving elements (10) that receive light that has been emitted from the light source (5) and has passed through the moving transmissive grating (2) sections and the fixed transmissive grating (8) sections, and an origin position detecting mechanism (3) for detecting an origin position of the moving grating plate (1), wherein the origin position detecting mechanism includes a moving grating region for origin position detection that is formed on the moving grating plate, a fixed grating region for origin position detection that is formed on the fixed grating plate, and a set of light receiving elements (11) for origin position detection that are included in the set of light receiving elements and the set of light receiving elements (11) for

origin position detection includes a set of Z phase light receiving elements that generate a Z phase signal and a set of Z' phase light receiving elements that generate a Z' phase signal that differs in phase to the Z phase signal (col. 2, line 44-54) which result to alignment of pattern of grating sections in the moving grating region and the fixed grating region and an alignment pattern of the set of Z phase light receiving elements and the set of Z' phase light receiving elements are determined so that one peak (fig. 1 (i.e. s_2 and R)) respectively appears in amounts of light received by the set of Z phase light receiving elements and the set of Z' phase light receiving elements when the moving grating plate moves, and the origin position of the moving grating plate is detected based on the Z phase signal and the Z' phase signal (fig. 1)(col. 2, line 20-30). Further, the reference of Schmitt disclose transmissive grating sections for origin detection and non-transmissive grating sections for origin detection for the moving transmissive grating sections and the fixed transmissive grating sections are aligned in the moving grating region and the fixed grating region, respectively, however the reference of Schmitt is silent regarding the sizes/dimensions of transmissive grating sections because there is no reason for the dimensions to be the same since they are independent of each other. Therefore it would have been obvious to one having ordinary skill in the art at the time of invention to provide transmissive grating sections for origin detection and non-transmissive grating sections for origin detection that are wider than the moving transmissive grating sections for the purpose of aligning respective one of the scanning fields.

As to claims 3 and 6, Schmitt discloses everything claimed, as applied to claim 1 and 4 above, in addition discloses wherein the set of light receiving elements includes a set of inverse Z phase light receiving elements that generate an inverse Z phase signal that is an inverse signal of the Z phase signal and a set of inverse Z' phase light receiving elements that generate an inverse Z' phase signal that is an inverse signal of the Z' phase signal, and the origin position of the moving grating plate is detected based on a differential signal of the Z phase signal and the inverse Z phase signal and a differential signal of the Z' phase signal and the inverse Z' phase signal (fig. 1 (i.e. graph))(col. 2, line 31-col. 3, line 1-35).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over of Schmitt. The reference of Schmitt discloses an optical encoder comprising of a light emitting element (5), a moving grating plate (1) with moving transmissive grating (2) sections of a predetermined width that are aligned at a fixed pitch, a fixed grating plate (7) with fixed transmissive grating (8) sections of a predetermined width that are aligned at a fixed pitch, a set of light receiving

elements (10) that receive light that has been emitted from the light source (5) and has passed through the moving transmissive grating (2) sections and the fixed transmissive grating (8) sections, and an origin position detecting mechanism (3) for detecting an origin position of the moving grating plate (1), wherein the origin position detecting mechanism includes a moving grating region for origin position detection that is formed on the moving grating plate, a fixed grating region for origin position detection that is formed on the fixed grating plate, and a set of light receiving elements (11) for origin position detection that are included in the set of light receiving elements and the set of light receiving elements (11) for origin position detection includes a set of Z phase light receiving elements that generate a Z phase signal and a set of Z' phase light receiving elements that generate a Z' phase signal that differs in phase to the Z phase signal (col. 2, line 44-54) which result to alignment of pattern of grating sections in the moving grating region and the fixed grating region and an alignment pattern of the set of Z phase light receiving elements and the set of Z' phase light receiving elements are determined so that one peak (fig. 1 (i.e. s_2 and R)) respectively appears in amounts of light received by the set of Z phase light receiving elements and the set of Z' phase light receiving elements when the moving grating plate moves, and the origin position of the moving grating plate is detected based on the Z phase signal and the Z' phase signal (fig. 1)(col. 2, line 20-30). Further, the reference of Schmitt disclose transmissive grating sections for origin detection and non-transmissive grating sections for origin detection for the moving transmissive grating sections and the fixed transmissive grating sections are aligned in the moving grating region and the fixed grating region, respectively, however the reference of Schmitt is silent regarding the type of optical encoder (i.e. reflective-type) and the sizes/dimensions of transmissive grating sections because there is no reason for the sizes/dimensions to be the same since they are independent of each other. Therefore it would have been obvious to one having ordinary skill in the art at the time of invention to provide transmissive grating sections for origin detection and non-transmissive grating sections for origin detection that are wider than the moving transmissive grating sections for the purpose of aligning respective one of the scanning fields, further optical encoders are classified into a reflection-type encoder and a transmission-type encoder as evident by Omi (5,995,229)(col. 1, line 13-16), it would have been obvious to one having ordinary skill in the art at the time of invention to provide a reflective-type optical encoder for the purpose of detecting reflected light from scale gratings.

Claims 2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmitt (4,85,836) in view of Nagase et al. (5,117,105) or Ogawa (5,499,098).

As regard to claim 2, Schmitt discloses a projection-type optical encoder comprising of a light emitting element (5), a moving grating plate (1) with moving transmissive grating (2) sections of a predetermined width that are aligned at a fixed pitch, a fixed grating plate (7) with fixed transmissive grating (8) sections of a predetermined width that are aligned at a fixed pitch, a set of light receiving elements (10) that receive light that has been emitted from the light source (5) and has passed through the moving transmissive grating (2) sections and the fixed transmissive grating (8) sections, and an origin position detecting mechanism (3) for detecting an origin position of the moving grating plate (1), wherein the origin position detecting mechanism includes a moving grating region for origin position detection that is formed on the moving grating plate, a fixed grating region for origin position detection that is formed on the fixed grating plate, and a set of light receiving elements (11) for origin position detection that are included in the set of light receiving elements, and the set of light receiving elements (11) for origin position detection includes a set of Z phase light receiving elements that generate a Z phase signal and a set of Z' phase light receiving elements that generate a Z' phase signal that differs in phase to the Z phase signal (col. 2, line 44-54) which result to alignment of pattern of grating sections in the moving grating region and the fixed grating region and an alignment pattern of the set of Z phase light receiving elements and the set of Z' phase light receiving elements are determined so that one peak (fig. 1 (i.e. s_2 and R)) respectively appears in amounts of light received by the set of Z phase light receiving elements and the set of Z' phase light receiving elements when the moving grating plate moves, and the origin position of the moving grating plate is detected based on the Z phase signal and the Z' phase signal (fig. 1)(col. 2, line 20-30). Further, the reference of Schmitt disclose transmissive grating sections for origin detection and non-transmissive grating sections for origin detection for the moving transmissive grating sections and the fixed transmissive grating sections are aligned in the moving grating region and the fixed grating region, respectively, however the reference of Schmitt is silent regarding the sizes/dimensions of transmissive grating sections and the arrangement in accordance with an M-series arrangement pattern because there is no reason for the dimensions to be the same since they are independent of each other. Therefore it would have been obvious to one having ordinary skill in the art at the time of invention to provide

transmissive grating sections for origin detection and non-transmissive grating sections for origin detection that are wider than the moving transmissive grating sections for the purpose of aligning respective one of the scanning fields. Further, the reference of Nagase show that the use of M-series is well know in the art (col. 1, line 19-52) as evidence by Ogawa (5,499,098)(col. 9 and col. 10), therefore it would have been obvious to one having ordinary skill in the art at the time of invention to provide transmissive grating sections for origin detection and non-transmissive grating sections for origin detection that are arrange in accordance with an M-series arrangement pattern for the purpose of synchronizing a signal for data transmission.

As regard to claim 5, Schmitt discloses a optical encoder comprising of a light emitting element (5), a moving grating plate (1) with moving transmissive grating (2) sections of a predetermined width that are aligned at a fixed pitch, a fixed grating plate (7) with fixed transmissive grating (8) sections of a predetermined width that are aligned at a fixed pitch, a set of light receiving elements (10) that receive light that has been emitted from the light source (5) and has passed through the moving transmissive grating (2) sections and the fixed transmissive grating (8) sections, and an origin position detecting mechanism (3) for detecting an origin position of the moving grating plate (1), wherein the origin position detecting mechanism includes a moving grating region for origin position detection that is formed on the moving grating plate, a fixed grating region for origin position detection that is formed on the fixed grating plate, and a set of light receiving elements (11) for origin position detection that are included in the set of light receiving elements, and the set of light receiving elements (11) for origin position detection includes a set of Z phase light receiving elements that generate a Z phase signal and a set of Z' phase light receiving elements that generate a Z' phase signal that differs in phase to the Z phase signal (col. 2, line 44-54) which result to alignment of pattern of grating sections in the moving grating region and the fixed grating region and an alignment pattern of the set of Z phase light receiving elements and the set of Z' phase light receiving elements are determined so that one peak (fig. 1 (i.e. s_2 and R)) respectively appears in amounts of light received by the set of Z phase light receiving elements and the set of Z' phase light receiving elements when the moving grating plate moves, and the origin position of the moving grating plate is detected based on the Z phase signal and the Z' phase signal (fig. 1)(col. 2, line 20-30). Further, the reference of Schmitt disclose transmissive grating sections for origin detection and non-transmissive grating sections for origin detection for the moving transmissive grating sections and the fixed transmissive grating sections are aligned in the

moving grating region and the fixed grating region, respectively. However the reference of Schmitt is silent regarding the type of optical encoder (i.e. reflective-type), the sizes/dimensions of transmissive grating sections and the arrangement in accordance with an M-series arrangement pattern because there is no reason for the dimensions to be the same since they are independent of each other, therefore it would have been obvious to one having ordinary skill in the art at the time of invention to provide transmissive grating sections for origin detection and non-transmissive grating sections for origin detection that are wider than the moving transmissive grating sections for the purpose of aligning respective one of the scanning fields. Further optical encoders are classified into a reflection-type encoder and a transmission-type encoder as evident by Omi (5,995,229)(col. 1, line 13-16), it would have been obvious to one having ordinary skill in the art at the time of invention to provide a reflective-type optical encoder for the purpose of detecting reflected light from scale gratings. The reference of Nagase discloses that the use of M-series is well know in the art (col. 1, line 19-52) as evidence by Ogawa (5,499,098)(col. 9 and col. 10), therefore it would have been obvious to one having ordinary skill in the art at the time of invention to provide transmissive grating sections for origin detection and non-transmissive grating sections for origin detection that are arrange in accordance with an M-series arrangement pattern for the purpose of synchronizing a signal for data transmission.

Additional Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The references listed in the attached form PTO-892 teach of other prior art projection/reflection-type optical encoder that may anticipate or obviate the claims of the applicant's invention.

Conclusion

Fax/Telephone Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Isiaka Akanbi whose telephone number is (571) 272-8658. The examiner can normally be reached on 8:00 a.m. - 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley Jr. can be reached on (571) 272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Isiaka Akanbi
February 16, 2006

LAYLA G. LAUCHMAN
PRIMARY EXAMINER